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[54] **ACTIVE SONAR RANGE-BEAM PARTITIONER**

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[57] **ABSTRACT**

A method and device for enhanced detection of active sonar input signals are provided. The method uses a multi-step manipulation of range-bearing data through lag vectors to map each resolution cell into a feature vector. Feature vectors are used to generate a set number of cluster means. Each feature vector is assigned to a given cluster mean, and the cluster means are used to further partition the input data. To eliminate over-fragmentation, similar clusters are consolidated to provide the correct level of resolution. The device comprises a standard active sonar system having a range-beam partitioner inserted between the initial signal filters and the final two-dimensional adaptive filter of the system. The range-beam partitioner manipulates the input data, forming it into homogeneous partitions according to the method and then provides the enhanced data to the adaptive filter. The use of both the method and device allow for the adaptive filter to more effectively estimate the co-variance structure of the entire range-beam space, eliminating errors from both the consolidation of non-homogeneous regions into single regions and from breaking homogeneous regions into more than a single region.

20 Claims, 3 Drawing Sheets